عنوان مقاله:

Collapse Behavior Evaluation of Double-Layer Barrel Vault Roofs with Double-Layer Vertical Walls subjected to three-Directional Ground Motions

محل انتشار:

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خلاصه مقاله:

This paper represents the collapse behavior of double -layer barrel vault roofs with vertical double-layer walls under three directional ground motions. For this purpose, different rise-to-span and height-to span ratios of roofs and walls have been studied using three-directional incremental dynamic analysis. The methodology of FEMA -P695 was applied to calculate collapse margin ratio (CMR) of each model. Incremental dynamic analyses were conducted using a set of far-field three-components of records and the performance of structures was assessed on the basis of comparing the calculated CMRs against the established acceptable limits. The results demonstrate that collapse of the structures occurs mainly due to the buckling -mode failure of the roof. The collapse performance of the structures with large rise-to-span ratio of roofs and large height-to-span ratio of walls is unacceptable. It appears that re-evaluation of their design parameters is necessary. Also, the comparison of collapse margin ratios and fragility curves indicates the significant reduction in the collapse level ground motion intensity with increasing the rise to span and height to span ratios of roofs and walls, respectively

کلمات کلیدی:

barrel vault, double-layer walls, incremental dynamic analysis, seismic collapse, FEMAP695.

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